

### **REMARKS**

The above amendments to the above-captioned application along with the following remarks are being submitted as a full and complete response to the Official Action dated May 12, 2005.

The Examiner is further requested to acknowledge receipt of the priority document filed August 8, 2001.

In view of the above amendments and the following remarks, the Examiner is respectfully requested to give due reconsideration to this application, to indicate the allowability of the claims, and to pass this case to issue.

#### **Status of the Claims**

Claims 1-10 are under consideration in this application. Claim 9 is being cancelled without prejudice or disclaimer. Claims 1-8 and 10 are being amended, as set forth above, in order to more particularly define and distinctly claim Applicants' invention.

The claims are being amended to correct formal errors and/or to better disclose or describe the features of the present invention as claimed. Applicants hereby submit that no new matter is being introduced into the application through the submission of this response.

#### **Formality Rejection**

Claims 1 and 5 were rejected under 35 U.S.C. § 112, first paragraph, for lacking antecedent basis for "said plurality of steady areas," and "said plurality of temporary areas."

As indicated, the claims are being amended as required by the Examiner. Accordingly, the withdrawal of the outstanding informality rejection is in order, and is therefore respectfully solicited.

#### **Prior Art Rejections**

Claims 1-8 were rejected under 35 U.S.C. § 102(e) on the grounds of being anticipated by US Patent App. Pub. No. 2002/0034379 of Tanaka (hereinafter "Tanaka"). The prior art reference of Hubis et al. (6,343,324) was cited as being pertinent to the

present application. This rejection has been carefully considered, but is most respectfully traversed.

The logical volume administration method of the invention, comprises: designating (*"at the time of designation"* p. 7, line 25) a plurality of logical volumes 140 (e.g., logic volumes A and B allocated for companies A and B respectively) in a disk apparatus 120 (Fig. 1; pp. 10-11) serving as a storage each of which is constructed by a steady area D0 or D1 to which a disk area 150A or 150B in the disk apparatus 120 is steadily allocated to (*"disk areas D0 and D1 are allocated to steady areas of logical volumes LV0 and LV1, respectively"* p. 12, lines 15-17; *"Data of one logical volume is steadily stored in each of the disk areas (150A and 150B) which do not belong to the disk pool 180."* P. 10, lines 6-9) and a temporary area D2 or D3 to which a disk area in the disk apparatus is not allocated until a task issues reads and writes to the temporary area (*"a disk area D2 is registered in the temporary area of the logical volume LV0"* p. 12, lines 2-4), allocating first disk areas 150A, 150B in said disk apparatus 120 as said plurality of steady areas D0, D1 of said plurality of logical volumes 140; allocating second disk areas 150C, 150D in said disk apparatus 120, which are different from said first disk areas 150A, 150B, as a disk pool 180, and allocating disk areas from said disk pool 180 in a time sharing manner to serve as said plurality of temporary areas D2, D3 of said plurality of logical volumes 140 (*"Data of a plurality of logical volumes is stored into the disk areas (150C and 150D) belonging to the disk pool 180 in a time sharing manner."* P. 10, lines 9-11) when the task issues reads and writes to the temporary areas D2, D3.

The invention, as recited in claim 5, is directed to a computer system for implementing the method recited in claim 1, comprising: a disk apparatus; and a computer which designates one of first disk areas of said disk apparatus to each of a plurality of logical volumes. Each of said logical volumes includes a steady area to which one of the first disk areas in the disk apparatus is steadily allocated to and a temporary area to which a disk area in the disk apparatus is not allocated until a task issues reads and writes to the temporary area. The computer allocates second disk areas in said disk apparatus, which are different from the first disk areas, as a disk pool, and allocates disk areas from said disk pool in a time sharing manner to serve as said temporary area of each of said logical volumes when the task issues reads and writes to the temporary area.

The invention, as recited in claim 8, is also directed to a computer system comprising: a storage apparatus; and a computer which designates one of first storage areas of said storage apparatus to each one of a plurality of logical volumes, said logical volumes being accessed by a task by issuing write in and read out. The storage apparatus includes said first storage areas and second storage areas which form a disk pool. Each of said logical volumes includes a steady area allocated from said first storage area of said storage apparatus and a temporary area from said disk pool of said storage apparatus. The computer allocates storage area from said disk pool of said storage apparatus to serve as temporary areas of said logical volumes in a time sharing manner when the task issues reads and writes to the temporary areas.

*“To the temporary area, a disk area is allocated as necessary in accordance with a task from disk areas (disk pool) which are not commanded by any tasks. For example, in the case of analyzing data of a company A providing a Web site described above, a disk pool is allocated to the temporary area in a logical volume A allocated to an analysis application executed for the company A, to store analysis data. In the case of analyzing data of a company B providing a Web site, a disk pool is allocated to the temporary area in a logical volume B allocated to an analysis application executed for the company B, to store analysis data. If the analysis execution time is adjusted between the companies A and B, the storage price which has to be conventionally paid by one user can be shared by the two companies, so that the cost of storing data in association with analysis is reduced. The order of analysis execution is determined according to the priorities determined on the companies A and B (logical volumes A and B). The storage service provider charges the company in accordance with the priority of the logical volume, maximum allocable size of the disk pool, and total use time  $\times$  use size. The steady area is used as a data area for smoothly performing the operations of the system such as provision of a Web page and collection of access data (p. 7, 1<sup>st</sup> paragraph).”*

Each logical volume in a disk apparatus serving as a storage of the invention is constructed by (1) a steady area D0 or D1 to which a disk area 150A or 150B in the disk apparatus 120 is steadily allocated to, and (2) a temporary area D2 or D3 to which a disk area in the disk apparatus is not allocated until a task issues reads and writes to the temporary area. When the task issues reads and writes to the temporary areas D2, D3, disk areas from the disk pool 180 are allocated in a time sharing manner to serve as the temporary areas D2, D3 of said plurality of logical volumes 140.

In contrast, Tanaka only discloses a information storage system that comprises temporary storage area 102 and ordinary storage area 104, which are provided in a plurality recording device groups, and these temporary storage areas are used "virtually in a ring structure; and always overwriting and recording inputted information" (paragraph [0032]; Fig. 2). As admitted by the Examiner (*"Regarding the claimed steady area..., Tanaka teaches a step of dividing and allocating a temporary storage area used for a ring buffer to the plurality of data storage unit"* p. 3, lines 19-21 of the outstanding Office Action), Tanaka's temporary storage area 102 corresponds to the steady area of the invention.

Contrary to the Examiner's assertion that the storage unit kept in a stopped state (i.e., a non-spinning condition) corresponding to the temporary area of the invention (p. 3, last line to p. 4, line 5 of the outstanding Office Action), Tanaka never discloses or suggests "temporary areas" as now recited in the claims, i.e., a temporary area D2 or D3 to which a disk area in the disk apparatus is not allocated until a task issues reads and writes to the temporary area, and only when the task issues reads and writes to the temporary areas D2, D3, disk areas from the disk pool 180 are then allocated in a time sharing manner to serve as the temporary areas D2, D3 of said plurality of logical volumes 140. The Examiner did not comment on any teachings of Tanaka corresponding to "in a time sharing manner" in the outstanding Office Action.

As admitted by the Examiner (p. 2. lines 4-5 of the outstanding Office Action), Tanaka does not phase "logical volume" as defined in claims 1, 5 and 8. The prior art definition of "logical volume" was relied upon by the Examiner to compensate for Tanaka's deficiencies. However, the prior art definition of "logical volume" as "groups of information located on physical volumes" is essentially different from what defined in the claims: each logical volume in a disk apparatus serving as a storage of the invention is constructed by (1) a steady area D0 or D1 to which a disk area 150A or 150B in the disk apparatus 120 is steadily allocated to, and (2) a temporary area D2 or D3 to which a disk area in the disk apparatus is not allocated until a task issues reads and writes to the temporary area. When the task issues reads and writes to the temporary areas D2, D3, disk areas from the disk pool 180 are allocated in a time sharing manner to serve as the temporary areas D2, D3 of said plurality of logical volumes 140.

In essence, Tanaka simply fails to teach or suggest such a **unique logical volume scheme** as in the present invention. Since Tanaka's ordinary storage area 104 and

temporary storage area 102 of a plurality recording device groups (A-D) are physical storage areas, each of these ordinary storage area 104 and temporary storage area 102 merely corresponds to a physical disk area (rather than any "logical volume") according to the invention. For example, Tanaka's temporary storage area 102 is used as "virtually in a ring structure" and always overwrote and recording inputted information. This means that the temporary storage area 102 of Tanaka, at most, corresponds to a steady area of the invention.

As such, the cited references or their combinations fall far short of anticipating or even rendering obvious every feature of the present invention as now claimed in claims 1, 5 and 8. The present invention as now claimed is distinguishable and thereby allowable over the rejections raised in the Office Action. The withdrawal of the outstanding prior art rejections is in order, and is respectfully solicited.

#### Conclusion

In view of all the above, clear and distinct differences as discussed exist between the present invention as now claimed and the prior art references upon which the rejections in the Office Action rely, Applicants respectfully contend that the prior art references cannot anticipate the present invention or render the present invention obvious. Rather, the present invention as a whole is distinguishable, and thereby allowable over the prior art.

Favorable reconsideration of this application is respectfully solicited. Should there be any outstanding issues requiring discussion that would further the prosecution and allowance of the above-captioned application, the Examiner is invited to contact the Applicants' undersigned representative at the address and phone number indicated below.

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August 12, 2005